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(54) Title: FLAVOUR COMPOSITION

(57) Abstract: A flavour composition in the form of a homogeneous emulsion comprising a flavour encapsulated in a glassy carbohydrate matrix composed of a composition comprising a blend of polydextrose and lactitol.

FLAVOUR COMPOSITION

FIELD OF THE INVENTION

The present invention relates to a flavour composition more particularly to a flavour encapsulated in a glassy carbohydrate matrix, composed of a composition comprising a blend of polydextrose and lactitol.

BACKGROUND OF THE INVENTION

There is a long history of patents being issued for flavor encapsulation via extrusion of carbohydrate glasses, e.g. US Patents #5009900, 5087461, 5603971, 4232047, 4820534, and 4689235 and International Patents WO 94/23593, WO 96/38055, WO 98/20756, WO 86/00502. However, none of these have carbohydrate blends incorporating lactitol. However, all these patents disclose the requirement of adding water or other plasticiser during the extrusion process.

We have found that a composition comprising a blend of polydextrose and lactitol eliminates the need for the addition of water (or another plasticizer) in the extrusion. This improves the encapsulation properties of the technique, since the presence of other than small amounts of water, for instance above about 3 to 3.5% by weight, in the final product will inhibit the glassy properties of the carbohydrate matrix. It also eliminates any plasticizer removal techniques mentioned in, for example, US Patent 5603971. The shelf life of the flavour is also extended because it will ensure that the glass transition temperature is above room temperature (shelf life conditions) during storage.

SUMMARY OF THE INVENTION

Accordingly, the present invention provides a flavour composition in the form of a homogeneous emulsion comprising a flavour encapsulated in a glassy carbohydrate matrix composed of a composition comprising a blend of polydextrose and lactitol.

DETAILED DESCRIPTION OF THE INVENTION

The amount of flavour in the composition may be up to 30%, preferably from 0.1 to 25%, and more usually from 0.5 to 20% by weight based on the weight of the composition.

The invention is particularly advantageous for savoury flavours and examples of flavours are tomato, chicken, beef and grilled flavours.

The matrix provides an effective barrier against both diffusion and oxidation because of its low permeation properties in the glassy state. The matrix composition is preferably adjusted to ensure it retains its glass behavior in typical storage conditions.

The matrix material may contain small quantities of an emulsifier, e.g. from 0.1 to 5% and preferably from 0.5 to 3.5% by weight of the matrix. The purpose of the emulsifier is to create a homogeneous product at the extruder outlet so that the flavor receives maximum protection from the matrix.

The amount of lactitol in the blend of polydextrose and lactitol may be from 5 to 50%, preferably from 10 to 40%, and more preferably from 15 to 35% by weight based on the weight of the blend.

The flavour composition in the form of a homogeneous emulsion comprising a flavour encapsulated in a glassy carbohydrate matrix may be prepared by feeding a blend of polydextrose, lactitol and, preferably, small quantities of an emulsifier into an extruder, mixing, and heating up to from 90°C to 130°C, preferably from 100°C to 125°C, adding the flavor to this blend, and transporting the entire mixture with mixing along the extruder barrel to the exit where the homogeneous emulsion exits via a die on the extruder outlet, is cooled to room temperature via ambient air, and is ground into a powder, e.g. through a 4 mm mesh screen.

Any emulsifier with a hydrophilic/lipophilic balance (HLB) in the range of 3 to 10 may be used, preferably an emulsifier with a HLB Value in the range of 6 to 9. The emulsifier may be, for instance, Panodan® 150K (Danisco), a blend of diacetyl tartaric acid ester with mono-diglyceride with a HLB value between 7 and 8 which works effectively in the system.

While the technology of extrusion to improve flavor shelf life has been described in numerous patents and literature, this is the first known use of the polydextrose/lactitol blend combination as the carbohydrate matrix. In order to provide adequate flavor protection, this matrix material must have the following characteristics:

1) A glass transition temperature high enough to ensure the system remains in the glassy state throughout storage conditions. A matrix material in the glassy state will have very low diffusion values, thus preventing loss of the flavor component. This must be accomplished not only for the flavor system, but also for any applications in which it would be stored.

2) The ability to form a homogeneous emulsion between the flavor and matrix components. This may be facilitated by the addition of a small amount of emulsifier.

Polydextrose has a relatively high glass transition temperature. However, polydextrose is a hydroscopic material (A_w value of 0.07 at 20.6°C), and its use in a flavor system with higher moisture content would be likely to result in unacceptable glass transition behavior (the glass transition temperature drops as moisture is added).

We have found that, in order to obtain a high glass transition temperature without the full hydroscopic behavior exhibited by pure polydextrose, the amount of water in the blend of polydextrose and lactitol is preferably less than 3.5% by weight, and more preferably less than 3% by weight based on the weight of the blend, to achieve a glass transition above 40°C. Especially preferred water contents are less than 2.5% by weight based on the weight of the blend. The desired amount of water is conveniently achieved by not adding water for extrusion.

EXAMPLES

The following Examples further illustrate the present invention.

Example 1

A blend of 74 parts of polydextrose, 24 parts of lactitol, and 2 parts of Panodan® 150K (Danisco), a blend of diacetyl tartaric acid ester with mono-diglyceride, was fed into an extruder, mixing, and

heating up to 120°C, adding 3 parts of a liquid flavour (FIS Tomato Booster Flavour) to this blend, and transporting the entire mixture with mixing along the extruder barrel in which the screws turn at 150RPM, to the exit where the homogeneous emulsion exits at approximately 5 kg/hr during steady state operation via a die on the extruder outlet, is cooled to room temperature via ambient air, and is ground into a powder, e.g. through a 4 mm mesh screen. The moisture content is 2.5% by weight. The final mean (average) particle size is less than 300 microns.

The glass transition temperature was above room temperature, ensuring the material will remain in the glass state under normal storage conditions.

Examples 2 to 4

A similar procedure to Example 1 was carried out but using the following flavours in the amounts indicated:

FIS Chicken Booster Flavor POU49 - 5 parts
FIS Beef Booster Flavor 1.23.20 - 2 parts
FIS Grilled Booster Flavor #4.24 - 4 parts

The glass transition temperatures were above room temperature, ensuring the material will remain in the glass state under normal storage conditions.

CLAIMS

1. A flavour composition in the form of a homogeneous emulsion comprising a flavour encapsulated in a glassy carbohydrate matrix composed of a composition comprising a blend of polydextrose and lactitol.

2. A flavour composition according to claim 1 wherein the amount of flavour in the composition is from 0.1 to 25% by weight based on the weight of the composition.

3. A flavour composition according to claim 1 wherein the flavour is tomato, chicken, beef or grilled flavour.

4. A flavour composition according to claim 1 wherein the matrix material contains from 0.1 to 5% by weight of an emulsifier based on the weight of the matrix.

5. A flavour composition according to claim 4 wherein the hydrophilic lipophilic balance (HLB) of the emulsifier is in the range of from 3 to 10.

6. A process according to claim 4 wherein the emulsifier is a blend of diacetyl tartaric acid ester with mono-diglyceride.

7. A flavour composition according to claim 1 wherein the amount of lactitol in the blend of polydextrose and lactitol is from 5 to 50% based on the weight of the blend.

8. A flavour composition according to claim 1 wherein the amount of water in the blend of polydextrose and lactitol is less than 3% based on the weight of the blend.

9. A process for preparing a flavour composition in the form of a homogeneous emulsion comprising a flavour encapsulated in a glassy carbohydrate which comprises feeding a blend of polydextrose and lactitol into an extruder, mixing, and heating up to from 90°C to 130°C, adding the flavor to this blend, and transporting the entire mixture with mixing along the extruder barrel to the exit where the homogeneous emulsion exits via a die on the extruder outlet, is cooled to room temperature via ambient air, and is ground into a powder.

10. A process according to claim 9 wherein small quantities of an emulsifier are mixed with the polydextrose and lactitol in the extruder.